

SEQUENCE LISTING

<110> Korea Research Institute of Bioscience and Biotechnology
<120> Multiple stress-inducible peroxidase promoter derived from Ipomoea batatas
<130> 4fpo-02-03
<160> 30
<170> KopatentIn 1.71
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<213> Ipomoea batatas
<400> 1
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aagtggctgc tagacaacac tctagagtcg tcagtggccg acgtgctctc actacgccta 180
ggcatctcct ccggcaagct ttccgacgaa gactgcatac tctccgcccgt taaggaagtg 240
gtggacgcgcg ccattgatgc agaaacccgc atgggtgctt ccctcattcg cctcttcttc 300
catgactgct ttgttgatgt acgtacgcta attttgtacg atgatgtttt tttttttttt 360
tttttttttc ccactgcatt atattaggaa attaaacaga ttgaaatgtg tgttattaat 420
gtattatctg caggggttgtg acgcaggct tctactaaac gatacaccta ctccacccgg 480
agaacagacc gccggcggca ataataactc agtcagaggt tttgaggtga tacaacaagc 540
taaagagaat gtgataacca aatgtcccta catacaagta tcttgcgcg acatcttac 600
cattgctgcc cgtgattctt tccagagagt aagtccattt atttctaaag gttgaaattha 660
ataagaacaa gaatccaaac aaataacaga cagaaaaaaa aaaagattta tgtggttga 720
caatatgttg aaattgtttt tatatttaat gactagtatt tatgcattat atttatatgc 780
aactctaaac atgcagttta ctggagaaac gtacaccgtg actctggaa gactcgatgc 840
aagaacggcg aaccttacccg gagctaacac ccaactcgctc ggaccaaacg aggaattggc 900
atcgcaagtc gagaaatttg cggcgaaagg gttctccgaa acggagctag tcgccttgc 960
aggtgttac acgggtgggt tttcgagatg tccgcttttgcgttccca ttttcatcaa 1020
tcccccccg gcctccacgc tgcaatgcaa ctgtccgggtg agtcccgaac acaccggct 1080
ggtgggcctg gaccccaactc cggtgacgtg ggaccaaagt ttttactccg acgtggctaa 1140

cggacaaggg cttctgttct ccgacaacga gctgatgaat agcaacacca ccagcgccgc 1200
 cgtaggagg tacagggacg agatggacgc ttttcgcgc gatttcgcgc ccgccatgg 1260
 gaagatgagc ctcctgcccgc cgtccccgg agtggagctc gaaatccgag aggtttgcag 1320
 cgaggtgaat gccaacacag ttgcattccat gtgaagttcg ttccatcga catcaataac 1380
 gtctgtgatt ctgtgaaagt ttactcgga ctgtgaagaa ttttacttt ctgttgttc 1440
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 ataaatttgt ta 1512

<210> 2
 <211> 110
 <212> DNA
 <213> Ipomoea batatas

<220>
 <221> promoter
 <222> (1)..(110)
 <223> -110 deletion promoter

<400> 2
 tttcccttcc aagttctcta tttaaggaag cctgagaagc cattaatcct catcatcagc 60
 tcgaccacac atttcttctt catacttcct ttgctgtgat aatcatcatc 110

<210> 3
 <211> 177
 <212> DNA
 <213> Ipomoea batatas

<220>
 <221> promoter
 <222> (1)..(177)
 <223> -177 deletion promoter

<400> 3
 aaattaaatc tcagtttgct ttattatatt attatcaaca ataataat aataactgatc 60
 gaagaacttt ccctttcaag ttctctat aaggaagcct gagaagccat taatcctcat 120
 catcagctcg accactcatt tcttcttcat acttccttgc ctgtgataat catcatc 177

<210> 4
 <211> 306
 <212> DNA
 <213> Ipomoea batatas

<220>
 <221> promoter

<222> (1)..(306)
<223> -306 deletion promoter

<400> 4
taagggtgtt tatacggtggca gcatgagtgca atgacaaacg catatattat tattaaaaca 60
aaatagtact ccaatcataa taaattatct tatattatat tgccaacaat taaaaattca 120
aattagaaca aattaaatct cagtttgctt tattatatta ttatcaacaa taataattta 180
atactgatcg aagaactttc cctttcaagt tctctattta aggaagcctg agaagccatt 240
aatcctcatc atcagctcga ccactcattt cttcttcata cttcccttgc tgtgataatc 300
atcattc 306

<210> 5
<211> 366
<212> DNA
<213> Ipomoea batatas

<220>
<221> promoter
<222> (1)..(366)
<223> -366 deletion promoter

<400> 5
tagtataatg aaataaaagtt aatcattctc tatatttgat gatggtaatt agtatcatgg 60
taagggtgtt tatacggtggca gcatgagtgca atgacaaacg catatattat tattaaaaca 120
aaatagtact ccaatcataa taaattatct tatattatat tgccaacaat taaaaattca 180
aattagaaca aattaaatct cagtttgctt tattatatta ttatcaacaa taataattta 240
atactgatcg aagaactttc cctttcaagt tctctattta aggaagcctg agaagccatt 300
aatcctcatc atcagctcga ccactcattt cttcttcata cttcccttgc tgtgataatc 360
atcattc 366

<210> 6
<211> 433
<212> DNA
<213> Ipomoea batatas

<220>
<221> promoter
<222> (1)..(433)
<223> -433 deletion promoter

<400> 6
atggtgactt aaagggtctga atccaaacata tattctgaca tttaaaaatg ctaacgtacg 60

gttagattag tataatgaaa taaagttaat cattctctat atttgatgtat ggtaattagt 120
 atcatggtaa ggtgttttat cgtggcagca tgagtgcattg acaaacgcattt atattattat 180
 taaaacaaaa tagtactcca atcataataa attatcttat attatattgc caacaattaa 240
 aaattcaaat tagaacaaat taaatcttag tttgctttat tatattatta tcaacaataa 300
 taatttaata ctgatcgaag aactttccct ttcaagttct ctatthaagg aagcctgaga 360
 agccattaaat cctcatcatc agctcgacca ctcatttctt cttcataactt cctttgctgt 420
 gataatcatc atc 433

<210> 7
 <211> 818
 <212> DNA
 <213> Ipomoea batatas

<220>
 <221> promoter
 <222> (1)..(818)
 <223> -818 deletion promoter

<400> 7
 gcttcacgca ctcaactagt cacatcttc caggcaaaat ttactttct atgaatatga 60
 gaagttccat ctatggaaat aacggattat ttatctaatt ttcaaattct atatatata 120
 tctcgagtgg aacaaaaata gaactaattt gaacaaatca aagtctaaga aaataata 180
 tgcttagca gcaaaaataa gaatggtaact atacttaatc ctcatcatag tcttcaaccc 240
 tgcatatagc acacttaaca ttttatattc aaatatactt taatttagtc atgataata 300
 aactcaccta ctccattata gccgataata caactcacct agctactcca ttatagtcca 360
 acaatata 420
 atgaataaaa tagtaatggt gacttaaagg gctgaatcca acatataattc
 tgacatttaa aaatgctaac gtacggtag attagtataa tgaaataaag ttaatcattc 480
 tctatatttg atgatggtaa ttagtatcat ggttaagggtgt tttatcgtgg cagcatgagt 540
 gcatgacaaa cgcatatattt attataaaa caaaatagta ctccaatcat aataaattat 600
 ctttatattt attgccaaca attaaaaatt caaattagaa caaattaaat ctcagttgc 660
 tttatttat tattatcaac aataataatt taatactgtat cgaagaactt tcccttcaa 720
 gttctctatt taaggaagcc tgagaagcca ttaatcctca tcattcagctc gaccactcat 780
 ttcttcttca tacttcctt gctgtgataa tcattcatc 818

<210> 8

<211> 1199
 <212> DNA
 <213> Ipomoea batatas

 <220>
 <221> promoter
 <222> (1)..(1199)
 <223> -1199 deletion promoter

 <400> 8
 atgcagggtg aaagtaagat tgaatatact gatactacaa ttaactaatg ataaagtata 60
 acttttgtaa aaaatttgat tttttttttt gatgaattca tatactccaa agatttcct 120
 catttaatta aatttctatc ctcatgttga acccattaat cgaataattg acatattaga 180
 taaaacttagc catcatatga catttgatca tgattgatga tttttaaaaaa ataaaaaacaa 240
 aattatgaaa gggtaatgaa atattttaaa aaaatttatgt aaaccctgta atctagtaat 300
 ctgtacaata ataattttgt ttcaactaag aggatgttgg caaaagtata attaaacttg 360
 ttagtcttcgt acaataatta tgcttcacgc actcaactag tcacatctt ccaggcaaaa 420
 tttacttttc tatgaatatg agaagttcca tctatggaaa taacggatta tttatcta 480
 tttcaaattc tatatatata gtctcgagtg gaacaaaaat agaactaatt tgaacaaatc 540
 aaagtctaaag aaaataatac atgcttagc agcaaaaata agaatggtag tatacttaat 600
 cctcatcata gtcttcaacc ctgcatatag cacacttaac attttatatt caaatatact 660
 ttaatttagt catgataata caactcacct actccattat agccgataat acaactcacc 720
 tagctactcc attatagtc aacaatatca aatgaataaa atagtaatgg tgacttaaag 780
 ggctgaatcc aacatatatt ctgacattta aaaatgctaa cgtacggta gattagtata 840
 atgaaataaa gttaatcatt ctctatattt gatgatggta attagtatca tggtaagggt 900
 ttttatcgtg gcagcatgag tgcacatgacaa acgcatatat tattattaaa acaaaaatagt 960
 actccaatca taataaaatca tcttatatttattt tattgccaac aattaaaaat tcaaattaga 1020
 acaaaataaa tctcagtttgc ctttattata ttattatcaa caataataat ttaatactga 1080
 tcgaagaact ttccctttca agttctctat ttaaggaagc ctgagaagcc attaatcctc 1140
 atcatcagct cgaccactca tttcttcttc atacttcctt tgctgtgata atcatcata 1199

 <210> 9
 <211> 1467
 <212> DNA
 <213> Ipomoea batatas

 <220>

<221> promoter
<222> (1)..(1467)
<223> -1467 deletion promoter

<400> 9
ggctgtccgg aattctgtct ctctggacca gtttggcaa acaattttga aaccacactt 60
atactactcc aaaaattatg aaatttttat gtagcttct acacttata gactacatgt 120
ataaaaaata ttgggtcaaa ataccttacc gattttccc aaatattcac ggaacttact 180
gccagaatct accctgctt ttccttcac tattttcaca actataagca tatatggca 240
taaatatgac atgaacatgc atgaaccaat gcagggtgaa agtaagattg aatatactga 300
tactacaatt aactaatgat aaagtataac ttttgtaaaa aatttgattt ttttttttga 360
tgaattcata tactccaaag attttcctca ttaaattttaa tttctatcct catgttgaac 420
ccattaatcg aataattgac atattagata aacttagcca tcataatgaca tttgatcatg 480
attgatgatt tttaaaaaat aaaaacaaaaa ttatgaaagg gtaatgaaat attttaaaaa 540
aattatgtaa accctgtaat ctagtaatct gtacaataat aattttgttt caactaagag 600
gatgttggca aaagtataat taaacttgc atttcgtac aataattatg cttcacgcac 660
tcaactagtc acatcttcc aggcaaaatt tactttcta tgaatatgag aagttccatc 720
tatggaaata acggattatt tatctaattt tcaaattcta tatataatgt ctcgagtgga 780
acaaaaatag aactaatttg aacaaatcaa agtctaagaa aataatacat gcttttagcag 840
caaaaataag aatggtaacta tacttaatcc tcataatgt cttcaaccct gcatatacg 900
cacttaacat tttatattca aatatacttt aatttagtca tgataataca actcacctac 960
tccattatag ccgataatac aactcaccta gctactccat tatagtccaa caatatcaaa 1020
tgaataaaaat agtaatggtg acttaaagg ctgaatccaa catatattct gacattttaaa 1080
aatgctaacg tacggtaga ttagtataat gaaataaagt taatcattct ctatatttga 1140
ttagggtaat tagtataatg gtaagggttt ttatcgtggc agcatgagtg catgacaaac 1200
gcatatatttta ttataaaaac aaaatagtac tccaaatcata ataaatttac ttatattata 1260
ttgccaacaa ttaaaaattc aaattagaac aaattaaatc tcagtttgct ttattatatt 1320
attatcaaca ataataattt aataactgatc gaagaacttt cccttcaag ttctcttattt 1380
aaggaagcct gagaagccat taatcctcat catcagctcg accactcatt ttttcttcat 1440
acttccttgc ctgtgataat catcatc 1467

<210> 10

<211> 1934
<212> DNA
<213> Ipomoea batatas

<220>
<221> promoter
<222> (1)..(1934)
<223> -1934 deletion promoter

<400>	10	
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aatatcatct ctacttaaac tagagagatt tccaactctc aattaatcac caaaggtaac	180	
tctccaaata tccaaatgga aggttcaac ttccaaacta ataccaaacc aaccggacta	240	
atcataatca tattcataat cataaattgt ttctaactgc ccctgtccag aaattacagt	300	
tttgcgcagt ccgaaagatt gagccgtaa caatagttcc cgaactctt ttcacttcaa	360	
attttatgg tagaacccta acttatacgta ctgtatattcc ataaaaagtt ttggtcaccc	420	
agttcacga attaacacag aaaattacat ctttgccctt ggcagtggc tgtccggaaat	480	
tctgtctctc tggaccagtt ttggcaaaca attttggaaac cacacttata ctactccaaa	540	
aattatgaaa ttttatggt agttctaca cttatagaac tacatgtata aaaaatattg	600	
ggtcaaaata ctttaccgat ttttccaaa tattcacgga acttactgcc agaatctacc	660	
ctgttttcc ttccactat ttccacaact ataagcatat atggcataaa atatgacatg	720	
aacatgcacg aaccaatgca gggtaaagt aagattgaat atactgatac tacaattaac	780	
taatgataaa gtataacttt tgtaaaaaat ttgattttt ttttgatga attcatatac	840	
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aattgacata tttagataaac tttagccatca tatgacattt gatcatgatt gatgatttt	960	
aaaaaataaa aacaaaatta tgaaaggta atgaaatatt ttaaaaaat tatgtaaacc	1020	
ctgtatcta gtaatctgta caataataat ttgtttcaa ctaagaggat gttggcaaaa	1080	
gtataattaa acttgtgatc ttctacaat aattatgctt cacgcactca actagtccaa	1140	
tctttccagg caaaatttac ttttctatga atatgagaag ttccatctat ggaaataacg	1200	
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taatttgaac aaatcaaagt ctaagaaaat aatacatgct tttagcagcaa aaataagaat	1320	
ggtactatac ttaatcctca tcatagtctt caaccctgca tatagcacac ttaacatttt	1380	
atattcaaata atacttaat tttagtcatga taatacaact cacctactcc attatagccg	1440	

ataataacaac tcaccttagct actccattat agtccaacaa tatcaaatga ataaaatagt 1500
 aatggtgact taaagggctg aatccaacat atattctgac atttaaaaat gctaacgtac 1560
 ggtagatta gtataatgaa ataaaggtaa tcattctcta tatttcatga tggttaattag 1620
 tatcatggta aggtgtttta tcgtggcagc atgagtgcat gacaaacgcata tatttattata 1680
 ttaaaacaaa atagtactcc aatcataata aattatctta tattatatttgc ccaacaattt 1740
 aaaattcaaa tttagaacaaa tttaaatctca gtttgcttta ttatattattt atcaacaata 1800
 ataatttaat actgatcgaa gaactttccc tttcaagttc tctatatttgc gaagcctgag 1860
 aagccattaa tcctcatcat cagctcgacc actcatttct tcttcataact tcctttgctg 1920
 tgataatcat catc 1934

<210> 11
 <211> 2433
 <212> DNA
 <213> Ipomoea batatas

<220>
 <221> promoter
 <222> (1)..(2433)
 <223> -2433 promoter

<400> 11
 cctcatggag tatttcata actctttca gtatgaatga atcataacaat acaacgcagc 60
 gacgaataga ctgcgcctg aactagacat acgacaacat agccaccata cggaaaggc 120
 acttcaagct ctttatccccg taggctgcaa caacataacg acataacgac cactggcaa 180
 gggcatttac agccacccgt gggtaatca aggtcctcact cactcacttt agaaactaag 240
 gtttgaaaa catgatctt cttcagttt ttcttacaac aaatcattca ctttggacac 300
 atttcacaat tgagtccaat acttaaaccg gctacttcat tagccctga aggattttaa 360
 aaaaaacttt cactgcccgc aggctttca aacatcttt cctcattatc aagtgaggca 420
 ttttcctcaa aagtaaggtt ttgacaacct ttatataaaa atagcataacg ttttcaacg 480
 taagtttcat aacatattact tgccatctca ccacttcgtc ttaaacaatc taggatattc 540
 tttagatattc ttcatactca agtctcacac ttgaaatcaa tcaagactct tacactaaca 600
 attcctcaat atacctcata atatcatctc tacttaaact agagagattt ccaactctca 660
 attaatcacc aaaggttaact ctccaaatat ccaaatggaa ggttcaact tccaaactaa 720
 taccaaacca accggactaa tcataatcat attcataatc ataaattgtt tctaactgcc 780

cctgtccaga aattacagtt ttgcgcagtc cgaaagattg agccggtaac aatagttccc 840
 gaactcttt tcacttgaaa ttttatggt agaaccctaa cttatagtagtac ttgatatcca 900
 taaaaagttt tggtcaccta ggttcacgaa ttaacacaga aaattacatc tttgccctg 960
 gcagtgggct gtccggaatt ctgtctctct ggaccagttt tggcaaacaa tttgaaacc 1020
 acacttatac tactccaaaa attatgaaat ttttatggta gcttctacac ttatagaact 1080
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 cttaactgcca gaatctaccc tgcttttcc tttcactatt ttcacaacta taagcatata 1200
 tgggcataaa tatgacatga acatgcatga accaatgcag ggtgaaagta agattgaata 1260
 tactgatact acaattaact aatgataaag tataactttt gtaaaaaatt tgatttttt 1320
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 ttgaacccat taatcgaata attgacatat tagataaact tagccatcat atgacattt 1440
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 taaaaaaaaatt atgtaaaccc tgtaatctag taatctgtac aataataatt ttgtttcaac 1560
 taagaggatg ttggcaaaag tataattaaa cttgtgatct tcgtacaata attatgctc 1620
 acgcactcaa ctagtcacat ctttccaggc aaaatttact tttctatgaa tatgagaagt 1680
 tccatctatg gaaataacgg attatttatac taattttcaa attctatata tatagtctcg 1740
 agtggAACAA aaatagaact aatttgaaca aatcaaagtc taagAAAata atacatgctt 1800
 tagcagcaaa aataagaatg gtactatact taatcctcat catagtcttc aaccctgcat 1860
 atagcacact taacattttta tattcaaata tactttattt tagtcatgat aataacaactc 1920
 acctactcca ttatagccga taatacaact cacctagcta ctccattata gtccaacaat 1980
 atcaaatgaa taaaatagta atggtgactt aaaggctga atccaacata tattctgaca 2040
 tttaaaaatg ctaacgtacg gtttagattag tataatgaaa taaagttaat cattctctat 2100
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 attatattgc caacaattaa aaattcaaatt tagaacaaat taaatctcag tttgctttat 2280
 tatattatta tcaacaataa taatttaata ctgatcgaag aactttccct ttcaagttct 2340
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 cttcataactt ctttgctgt gataatcatc atc 2433

<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> GSP1 promoter

<400> 12
ctgagccgag tgacaaagga agccat 26

<210> 13
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> AP1 promoter

<400> 13
gtaatacgac tcactatagg gc 22

<210> 14
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> GSP2 promoter

<400> 14
cacagcaaag gaagtatgaa gaagc 25

<210> 15
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> AP2 promoter

<400> 15
actatagggc acgcgtgg 19

<210> 16
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> exon promoter

<400> 16
atggcttcct ttgtcactcg gctcag 26

<210> 17
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> intron promoter

<400> 17
tcatcagctc gaccactcat ttcttcttca 30

<210> 18
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> forward promoter for -2433 deletion promoter

<400> 18
gccaagcttg gtcctcatgg agtattctca taact 35

<210> 19
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> forward primer for -1934 deletion promoter

<400> 19
gccaagcttt tgccatctca ccacttcgtc tta 33

<210> 20
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> forward primer for -1467 deletion promoter

<400> 20
gccaagcttg gctgtccgga attctgtctc t 31

<210> 21
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> forward primer for -1199 deletion promoter

<400> 21
gccaagctta tgcagggtga aagtaagatt gaa 33

<210> 22
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> forward primer for -818 deletion promoter

<400> 22
gccaagcttg cttcacgcac tcaact 26

<210> 23
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> forward primer for -433 deletion promoter

<400> 23
gccaagctta tggtgactta aagggtgaa tcc 33

<210> 24
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> reverse primer for -2433, 1934, 1467, 1199, 818, 433, 366, 306, 177 and 110 deletion promoter

<400> 24
tcctctagag atgatgatta tcacagcaa ggaa 34

<210> 25
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> forward primer for -366 deletion promoter

<400> 25
ttcctgcaga tagtataatg aaataaaagtt a 31

<210> 26
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> forward primer for -306 deletion promoter

<400> 26
tttctgcagt aagggtttt atcgta 26

<210> 27
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> forward primer for -177 deletion promoter

<400> 27
ttcctgcaga aattaaatct cagtt 25

<210> 28
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> forward primer for -110 deletion promoter

<400> 28
ttcctgcagt ttccctttca agtt 24

<210> 29
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> forward primer for NPTII

<400> 29
gaggctattc ggcttagatg 19

<210> 30
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> reverse primer for NPTII

<400> 30
atcgggagcg gcgataccgt a

21